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EXAMINER

HUYNH, YENNHU B

ART UNIT PAPER NUMBER

2813

DATE MAILED: 12/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,855

Applicant(s)

METZLER, RICHARD A.

Examiner

Yennhu B Huynh

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6&7. 6) ☐ Other: _____

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DETAILED ACTION

This Office Action is in response to the Amendment B filed on 8/4/03.

Election/Restrictions

Applicant's election with traverse of claims 1-12 in Paper No. 10 is acknowledged. This is not found persuasive because they are different classifications and distinct species. An attempt to contact the Applicant was made by telephone on 12/10/03, however the Applicant was unavailable. Per Applicant request, a new restriction requirement is found below:

Group A: Claims 1-52, drawn to a method of processing for a semiconductor device, classified in class 438, subclass 100+, which include:

a) Species I: claims 1-12 drawn to a method of processing a semiconductor device having vertically etching horizontal surfaces of a first material.

b) Species II: claims 13-26 drawn to a method of processing a semiconductor device having diffusing a dopant into a first material located around the plurality of sidewalls.

c) Species III: claims 27-52, drawn to a method of processing a semiconductor device having diffusion barrier and epitaxial layer.

Group B: Claims 58-72 drawn to a system for manufacturing device, classified in class 257, subclass 288.

Claims in Group B do not overcome the restriction requirement or relation to the group A. According to the MPEP 803 the proper criteria between for a restriction is (1) the

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invention must be independent and separated and (2) there must be serious burden on the Examiner if the restriction is not required. The product and the process of manufacturing a semiconductor are considered to be separated and independent by the Office. They are classified in two different art classifications. It would be a serious burden on the Examiner to examine two such distinct inventions despite the fact that they are so closely related.

The requirement is deemed proper and is therefore made FINAL.

Information Disclosure Statement

The information disclosure statement is being considered by the examiner.

Oath/Declaration

Oath/Declaration filed on 10/22/01 is accepted.

Drawings

This application, filed under former 37 CFR 1.60, lacks formal drawings. The informal drawings filed in this application are acceptable for examination purposes. When the application is allowed, applicant will be required to submit new formal drawings. In unusual circumstances, the formal drawings from the abandoned parent application may be transferred by the grant of a petition under 37 CFR 1.182.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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Claim Objections

Claims 7 & 8, objected to because of the following informalities:

In claims 7 & 8, line 2 the recited limitation --a second material-- should be changed to --the second material--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann (U.S. 4,703,554) in view of Crotti et al. (U.S. 5,068,202).

Havemann at figs. 1-9 in related art disclose a technique for fabricating a sidewall base contact with extrinsic base on insulator, which include:

-Re. claim 1: providing a wafer including a substrate 1; forming a plurality of sidewalls 19 around a plurality of cylindrical pedestals 21 above a surface of the substrate (fig.3); removing the plurality of cylindrical pedestals (fig.4 and col. 1 & 2, lines 64- 68).

However, Havemann does not disclose vertically etching horizontal surfaces of a first material located around the plurality of sidewalls.

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Crotti et al. at figs. 1-4 in related text col. 1-4 disclose a process for encased trench isolation structures, which include vertically etching horizontal surfaces of oxide layer 5,4 located on sidewalls (figs. 3-8, col.2 & 3, lines 36-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Havemann invention by incorporation vertically etching horizontal surfaces of material located on sidewalls, to obtain substantially straight sidewalls and removing residue resist at outer sides of the sidewalls.

Havemann also discloses:

-Re. claims 2 & 9: wherein plurality of sidewalls are utilized as an etch stop or a diffusion barrier to protect the material layer under the plurality sidewalls from being etching and receiving dopant during diffusing into material around the plurality of sidewalls (Abstract, col. 1, lines 32-44, col.3 lines 1-13 and col. 3 & 4 lines 65-5).

-Re. claim 4: removing the plurality of sidewalls (cols. 2 & 3 lines, cols.3 & 4 lines 65-68 and col. 5 lines 6-19).

-Re. claims 5-8: diffusing a dopant into the material layers around the plurality of sidewalls (Abstract, col. 1 lines 32-44 and col. 2 lines 12-68).

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann (U.S. 4,703,554) in view of Crotti et al. (U.S. 5,068,202) and Yu (6,225,176B1).

Havemann and Crotti et al. disclose substantially of the claimed invention, but do not disclose wherein the plurality of sidewalls protect the first and/or second material under

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the plurality of sidewalls from receiving a dopant during the diffusing of the dopant into the first and/or second material.

-Re. claims 10-12: Yu at figs. 1-1-5 in related text col.1-8 disclose a method of fabricating an integrated circuit with a step drain and source junction, which include a plurality of sidewalls 33, 35, wherein the plurality of sidewalls protect the first and/or second material 40/42 under the plurality of sidewalls from receiving a dopant during the diffusing of the dopant into the first and/or second material (figs. 4,5 col. 5 & 6 lines 42-49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Havemann and Crotti et al. invention by incorporation plurality of sidewalls protect the first and/or second material under the plurality of sidewalls from receiving a dopant during the diffusing of the dopant into the first and/or second material, to obtain a properly diffusion region, for contacting to a conductive surface, for forming a connection of the diode through which current may flow.

Allowable Subject Matter

Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: The prior art do not disclose or suggest wherein the plurality of sidewalls protect the first material under the plurality of sidewalls from being etched during the vertical etching of the first material.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yennhu B Huynh whose telephone number is 703-308-6110 (and the new telephone number will be effected from 2/5/04). The examiner can normally be reached on 8.30AM-7.00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-7724.

Yennhu Huynh
Examiner
121003

